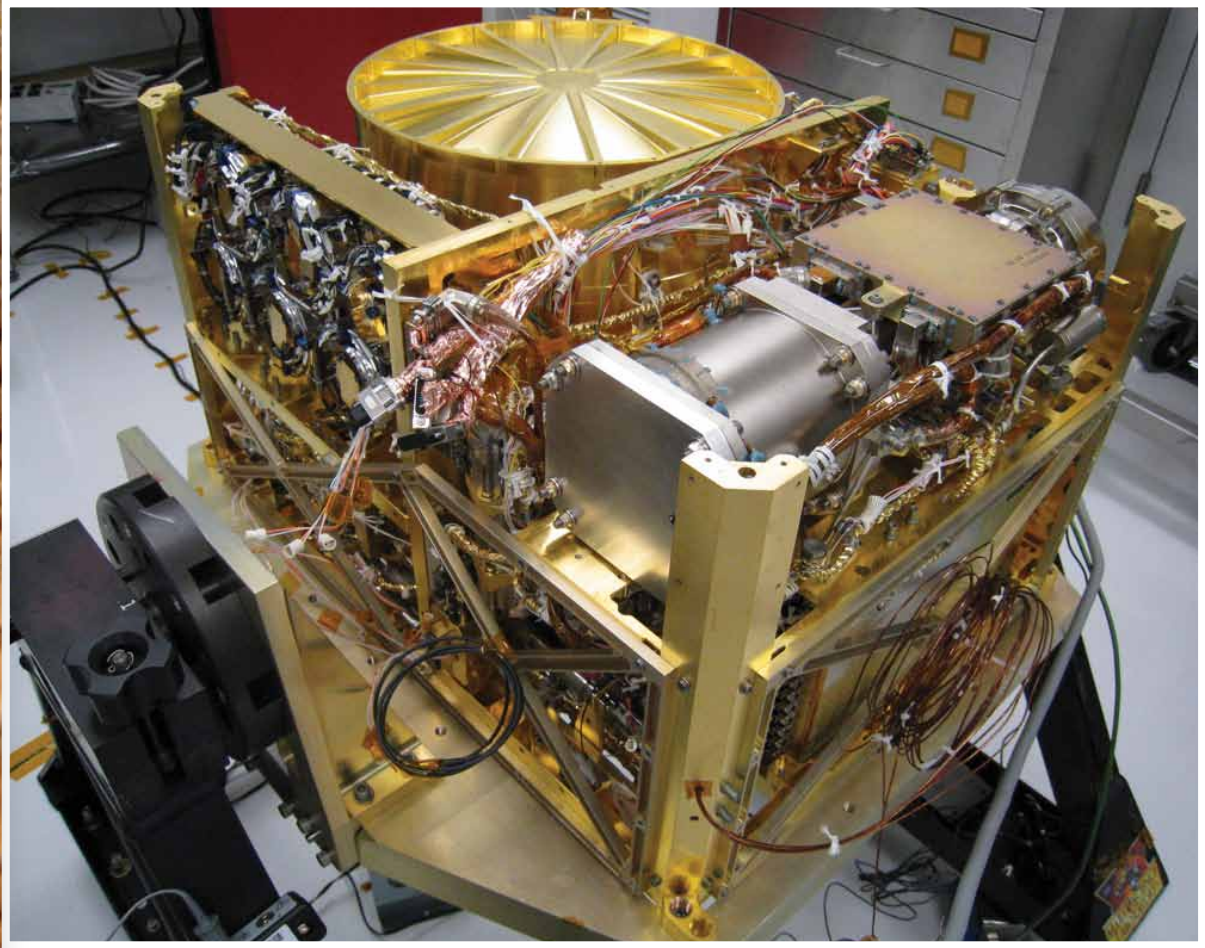
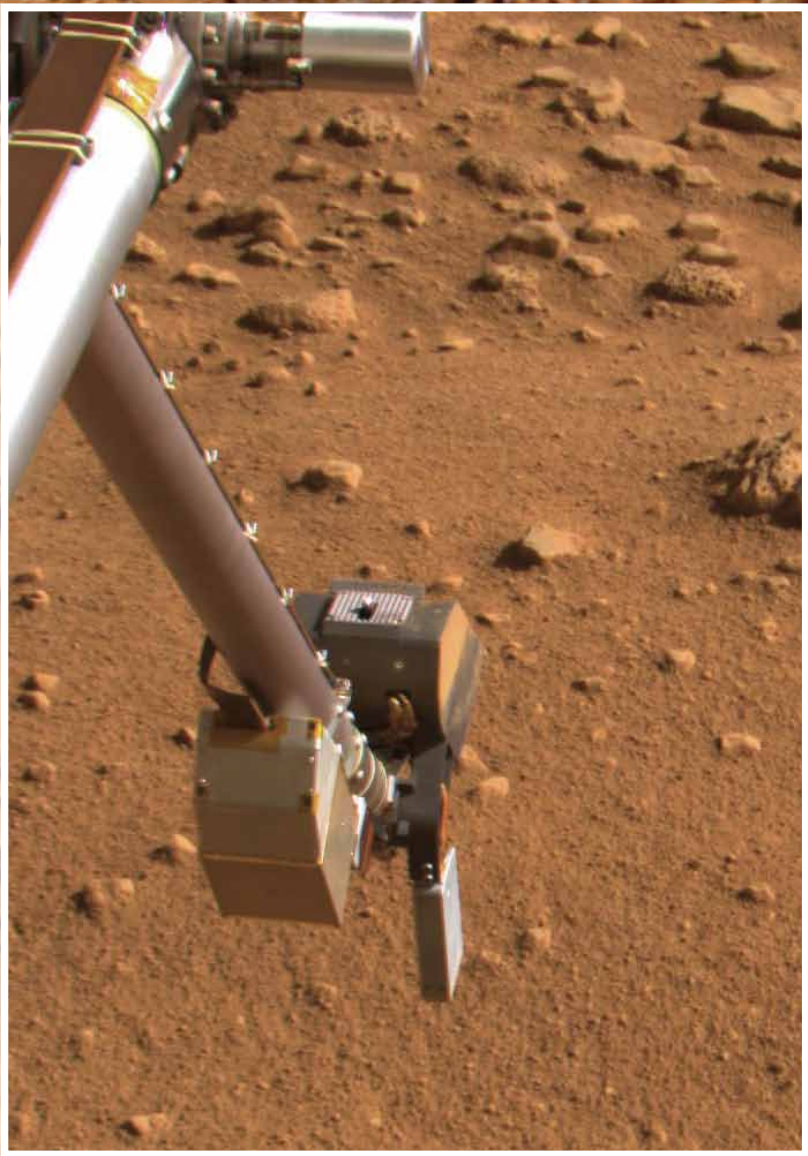


Sample Analysis at Mars (SAM): A Sample NASA Planetary Science Mission

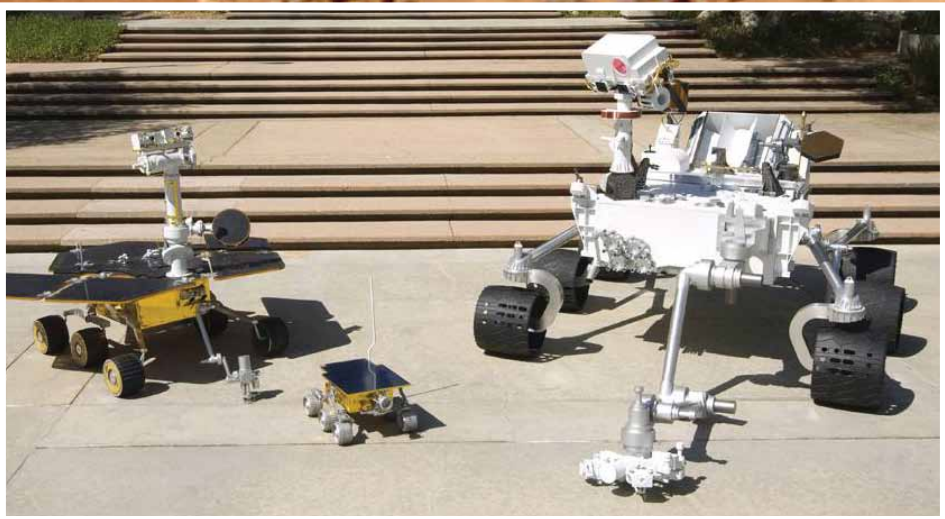
Florence Tan displaying the SAM hardware after its integration into the Mars rover Curiosity at the Jet Propulsion Laboratory, January 2011.



The SAM instrument suite under development at NASA Goddard Space Flight Center prior to integration into the rover Curiosity and eventual touchdown on Mars.



The robotic arm scoop of the Phoenix Mars Lander, in operation at the surface of Mars, July 14, 2008.



Comparative sizes of three major Mars rovers: on the left, Spirit, launched on the Mars Exploration Rover Mission in June 2003; in the center, Sojourner, launched on Mars Pathfinder in December 1996; and, on the right, Curiosity, yet to be launched.

Background Mars photograph from the Mars Pathfinder, 1997, courtesy of NASA.

Following on the successes of the Mars rovers Sojourner, Spirit, and Opportunity, NASA plans to launch the rover Curiosity on board the Mars Science Laboratory in late 2011, with an anticipated arrival at Mars in August 2012. Within the science payload on Curiosity will be a suite of instruments named Sample Analysis at Mars, or "SAM," constructed at NASA Goddard Space Flight Center under the direction of the SAM principal investigator Paul Mahaffy. SAM will analyze samples collected by Curiosity from both the Martian surface and the Martian atmosphere, doing so with sophisticated analysis instruments. This will add to the ever-deepening understanding of Mars brought about by modern technology and especially the sequence of rovers and orbiters sent to Mars by NASA over the past two decades.



The rover Curiosity undergoing testing at the Jet Propulsion Laboratory, September 10, 2010.

Some of the Women of Goddard Involved in Mars Missions



Photo by Claire Parkinson

FLORENCE TAN
ELECTRICAL ENGINEER

Is the Electrical Lead Engineer for SAM, as well as being the Electrical Lead Engineer for an instrument on the Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft. She has designed the electronics on a variety of mass spectrometers that have journeyed through the solar system.



Photo by Steve Graham

CARMEL CONATY
SYSTEMS ENGINEER

Was the Lead Mechanical Systems Engineer for the Mars Observer Laser Altimeter, which collected altimetry data from 1996 to 2001. She was responsible for the fabrication, test, and installation of the instrument, leading the effort from design through final verification testing prior to launch.



Photo by Jay Friedlander

JAN MCGARRY
APPLIED MATHEMATICIAN

Helped develop the algorithms to make the Mars Orbiter Laser Altimeter the first planetary laser altimeter to optimize its data collection using signal processing techniques. Jan and her colleagues also precisely measured the distance to the Mars Global Surveyor through Satellite Laser Ranging.

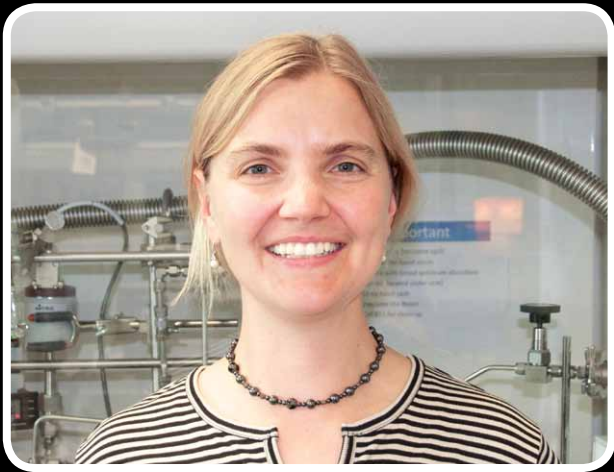


Photo by Claire Parkinson

DIANE PUGEL
PHYSICIST & ELECTRICAL ENGINEER

Is a deputy instrument manager for the Mars Organic Molecule Analyzer (MOMA), a sophisticated instrument to detect organic compounds on Mars. MOMA will be installed on a Mars rover on the ExoMars mission, a joint NASA and European Space Agency mission on the Exobiology of Mars.



SUSAN BREON
CRYOGENICS ENGINEER

Is working on ways to slow down the evaporation of the fuel needed to send an astronaut and/or sample-collecting robot to Mars and back. This fuel is composed of liquid hydrogen and liquid oxygen, and enough needs to survive in order to fire the rockets to lift off from Mars for the return to Earth.



Photo by Chris Gurn

NANCY CAROSSO
AEROSPACE CONTAMINATION ENGINEER

Is developing Planetary Protection capabilities, to ensure that biological contaminants are not sent to Mars or other planets and are not returned to Earth from Mars or other planets. She is the Chief Engineer for Goddard's Contamination and Coatings Branch.



KELLY FAST
PLANETARY SCIENTIST

Studies the atmosphere of Mars using Goddard instruments at observatories on Mauna Kea, Hawaii, and the Mars Express spacecraft. She conducts the only direct measurements of ozone on Mars possible from Earth-based telescopes and works with modelers to study Mars' atmospheric chemistry.



Photo by Telana Jackson

TELANA JACKSON
PLANETARY SCIENTIST

Began her Goddard career by performing Mars-analog dust devil studies in the western U.S. with a highly sensitive, portable electrometer that she designed. Since then she has developed a numerical Dust Devil Electron Avalanche Model to examine interactions in the Martian atmosphere.



Photo by Claire Parkinson

LYNN CARTER
PLANETARY SCIENTIST

Has used radar data from the Mars Reconnaissance Orbiter to study the surface of Mars and has done field work on Earth with ground penetrating radars that could be adjusted for use on Mars. She is exploring how volcanoes and impact craters have shaped the Martian and other planetary surfaces.

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Adding history to history to tell our story